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JRP 8-19-04
H/M

Donald W. Weaver III
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August 18, 2004

Mr. John Robertus, Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: John Phillips
Hashim Navrozali

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2004 AUG 18 PM 12:57

**RE: Comments on Tentative Order No. R9-2004-0154, Waste Discharge
Requirements for Duke Energy South Bay LLC**

Dear Mr. Robertus:

Duke Energy South Bay LLC ("Duke Energy") hereby submits the following comments on the Tentative Order No. R9-2004-0154, NPDES permit No. CA0001368, for the South Bay Power Plant ("SBPP").

Effluent Limitations for Copper

The Tentative Order ("TO") includes new water-quality-based effluent limits for copper derived in accordance with the procedure set forth in the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California ("State Implementation Policy" or "SIP"). The TO does not contain any schedule of

compliance, and the new limits become effective immediately upon adoption of the order. As discussed below, immediate compliance with these new limits is infeasible.¹

Order No. 96-05 (the current NPDES permit for the SBPP) required San Diego Gas & Electric ("SDG&E"), the prior owner of the plant, to eliminate discharge of all low-volume (or "in-plant") waste streams to San Diego Bay by December 31, 1997. The permit contained interim discharge limits that applied to the combined discharge during the period prior to elimination of these wastes, which had the potential to contain copper and other heavy metals. Upon elimination of these streams, the metals limits, including limitations on copper, were no longer applicable. SDG&E certified elimination of all in-plant waste streams in September, 1997. Thus, SBPP has not been subject to any copper limits (or other limits on heavy metals) since that time. With the exception of stormwater, the SBPP discharge now consists entirely of once-through cooling water drawn from the bay. In addition, the SBPP also uses "impressed current" cathodic protection to minimize corrosion of the copper-alloy condenser tubes through which the cooling water passes. Thus, SBPP has already taken all feasible steps to eliminate copper from its discharge by eliminating all copper-containing in-plant waste streams and implementing best available technology to minimize copper corrosion and discharge associated with the cooling water system.

It has been established through numerous investigations and studies that the primary source for copper in San Diego Bay is copper-based marine paints used on Navy and merchant ships and privately owned pleasure craft. The known distribution of copper in the bay is consistent with these sources (shipyards and marinas). While ambient concentrations tend to be lower in south San Diego Bay, they still exceed the water quality-based effluent limits contained in the TO.² These ambient levels of copper are not attributable to SBPP in any material respect. As a requirement of Order No. 96-05, SDG&E was required to perform a study to determine the annual rate of copper emissions from the power plant. This study estimated copper emissions at 0.39 ± 0.17 $\mu\text{g/L}$, based on continuous, full-load operation of the power plant.³ Using this assumption, maximum copper loading associated with the SBPP was conservatively estimated at 710 ± 310 lbs/year.⁴ By comparison, the estimated annual mass emission of copper from all sources to San Diego Bay exceeds 50,000 lbs/yr. Given the high volume of the SBPP cooling water discharge (up to 601 MGD) and the extremely low concentrations of copper in the water, it is neither technically nor economically feasible to treat the cooling water prior to discharge.

¹ The Average Monthly Emission Limit ("AMEL") and Maximum Daily Emission Limit ("MDEL") were calculated at 2.93 $\mu\text{g/L}$ and 3.68 $\mu\text{g/L}$, respectively. Upon review of the SIP, Duke Energy determined that these limits had been calculated incorrectly. The RWQCB staff is aware of the mistake and has indicated that an erratum will be issued containing the properly calculated limit.

² In recent receiving water monitoring conducted by Duke Energy, ambient concentrations of total copper in south San Diego Bay were found to range between 3.63 $\mu\text{g/L}$ and 35.2 $\mu\text{g/L}$.

³ It should also be noted that the estimated addition of copper by the power plant is quite literally immeasurable by any means other than a research study such as the one done by SDG&E—and even that study has significant limitations and uncertainty. The relatively minor addition of copper to the cooling water is dwarfed by both the uncertainty of the analytical method used to measure copper and the variability of copper concentrations in the intake water.

⁴ Because the plant does not continually operate at full load, the actual copper discharge mass is necessarily lower.

Duke Energy is very concerned about the copper limits contained in the TO because SBPP has already taken all feasible steps to minimize copper emissions. Furthermore, it is evident the SBPP is not a significant source of copper and that even complete elimination of copper from the cooling water system would not result in any measurable improvement in ambient copper concentrations in San Diego Bay. Even if SBPP could eliminate all potential sources of copper associated with its cooling water discharge (which it cannot), the ambient concentrations of copper in the intake water would still result in exceedances of the proposed AMEL and MDEL.

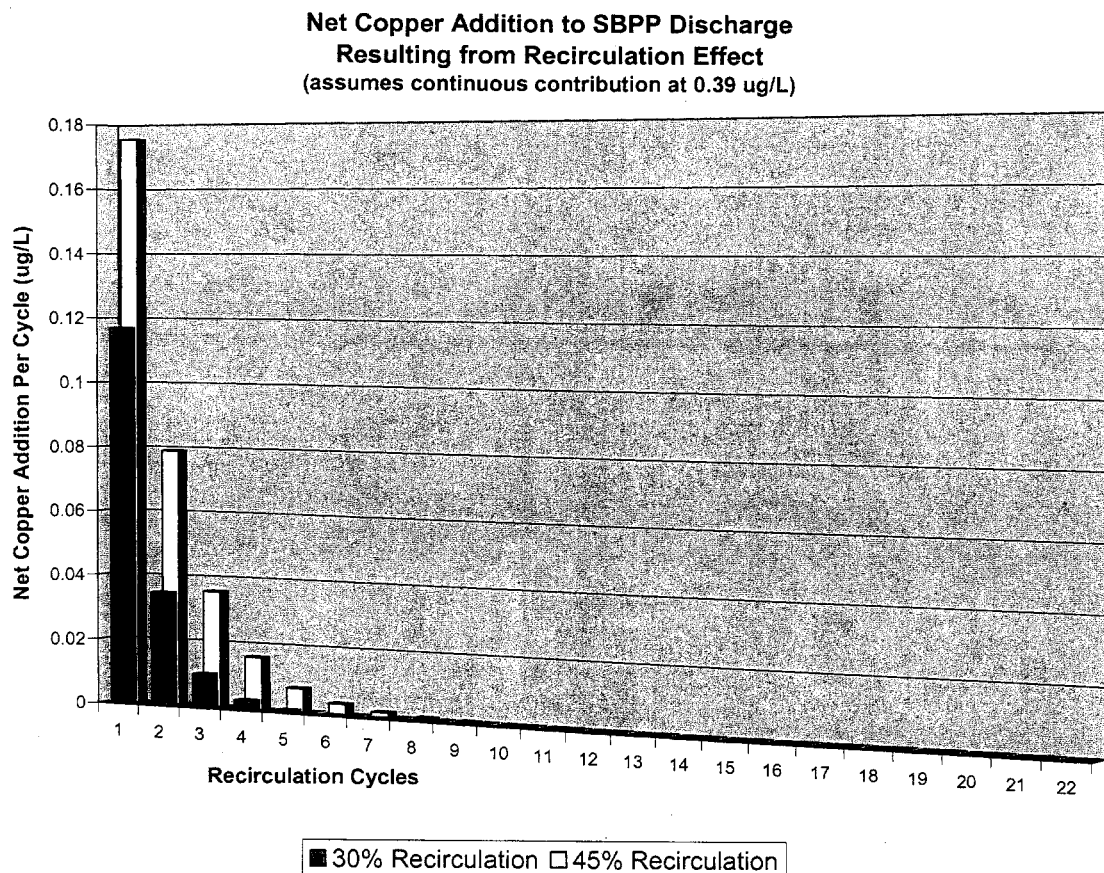
The Regional Board is aware that the California Independent System Operator ("CAISO") has designated the SBPP as Reliability-Must-Run facility because of the SBPP's essential role in supporting the reliability of the electric grid in the San Diego region. Additionally, Duke Energy is committed to operating its facilities in full compliance with all laws and permit limits. Therefore, it is important to understand that Duke Energy will not operate the SBPP unless we are assured of our ability to do so in compliance with all conditions of our permit. The SIP provides limited options for resolving this issue, and the options that are provided need to be carefully considered by both Duke Energy and the Regional Board staff. Given its implications, this issue warrants delaying adoption of the TO until an alternative satisfactory to both the Regional Board and Duke Energy can be found. If adoption of the permit cannot be delayed for this reason, then, at a minimum, the permit must be revised to include a compliance schedule, as allowed by Section 2.1 of the SIP. Under the California Toxics Rule, a compliance schedule of up to five years is permissible where immediate compliance has been shown to be infeasible.

Entrainment of Discharge Plume

An alternative means of addressing the copper issue would be to grant SBPP intake credits based on ambient concentrations of copper in south San Diego Bay. Intake credits are allowed under the Clean Water Act in circumstances where the discharge occurs into the same body of water from which the water was withdrawn (40 C.F.R. §122.45). However, the TO and Fact Sheet are replete with references to the potential for the SBPP to entrain the discharge plume into the intake channel. The inference is that such an effect causes a perpetual increase in the concentration of pollutants added to the discharge by the SBPP. This circulation effect is cited as the reason why the SBPP should not qualify for intake credits. However, this effect is highly overstated and ultimately of little concern. Moreover, this same concern was raised during the 1996 NPDES permit renewal and answered at that time to the apparent satisfaction of the Regional Board.⁵

⁵ During the renewal process, at the request of the Regional Board, SDG&E engaged Merkel and Associates and Scott Jenkins, Ph.D., a coastal engineer at Scripps Institute of Oceanography, to clarify and quantify the recirculation effect. Merkel and Jenkins demonstrated that the concentrating effects of recirculation could be calculated, but that even using the admittedly conservative assumptions for both the south San Diego Bay tidal exchange ratio and proportion of the SBPP discharge subject to re-entrainment, the effects were still immeasurable for pollutants associated with the SBPP discharge, such as copper and nickel. Their report, entitled *South Bay Water Residence and Recirculation*, was submitted to the Regional Board in 1996.

The following figure illustrates the changes in ambient copper concentration in the SBPP discharge as a result of the circulation effect. This assumes a continuous discharge rate for copper of $0.39 \mu\text{g/L}$ (the estimate from the SDG&E copper study) and covers a range of plume recirculation from 30% to 45% (the estimates from the Merkel/Jenkins report). The chart clearly shows that any measurable concentrating effect from recirculation of the discharge plume occurred in the first few recirculation cycles, i.e., in 1960, when the plant was first commenced operation.



The net additional ambient copper concentration is the sum of the values for each recirculation cycle. At 30% recirculation, the net addition to the ambient copper concentration over the entire life of the power plant is less than $0.17 \mu\text{g/L}$ and at 45%, the net is less than $0.32 \mu\text{g/L}$. This increase in concentration is within the range of analytical uncertainty given the ambient concentration of total copper is typically 10 to 100 times higher. Thus, the recirculation effect simply does not merit consideration and any continuing refusal to recognize intake credits based on this concern would be unwarranted.

Relocation of the Thermal Discharge Limit Compliance Point

The TO includes a requirement that Duke Energy relocate the thermal discharge compliance point to the property line by the expiration of the permit. The TO and associated Fact Sheet give two reasons for requiring this move. One reason is the Regional Board's desire that the SBPP demonstrate compliance with all discharge parameters at one compliance point located on the property line. The other reason is the apparent belief—which we believe to be mistaken—that Duke Energy is “not in full compliance with Section 316(a) requirements.” We do not believe that either of these reasons provides an adequate justification for relocation of the compliance point. In particular, Duke Energy takes strong exception to the assertion that the SBPP is “out of compliance” with Section 316(a) of the federal Clean Water Act.

Compliance with Section 316(a)

The TO identifies a “loss of eelgrass habitat and a lower diversity or loss of certain species of benthic invertebrates” as reasons why the SBPP does not comply with Section 316(a) requirements. In its technical guidance for existing thermal discharges, the EPA recognizes that every discharge will have some impact on the receiving water and that the key question is the magnitude of the impact and its significance on the stability and productivity of the biological community affected. In order to be considered out of compliance with Section 316(a), the thermal effects would have to cause biological changes so substantial that community imbalance, elimination or replacement would result. The independent scientists who performed the thermal effects study for the SBPP did not find this to be the case.

The most recent thermal effects study findings are consistent with those of prior studies. Those prior studies were cited by the Regional Board in previous NPDES permits as evidence that the discharge met the “balanced indigenous community” (“BIC”) standard of Section 316(a). There is no evidence in the most recent study to contradict that finding. In fact, the following results from the recent study further strengthen the conclusion of compliance with Section 316(a):

- The benthic community sampling for the most recent study was done at a finer spatial scale than previous studies and results showed that impacts from the discharge occurred in areas that are smaller than those thought to be affected by the discharge in previous studies.
- The SBPP discharge channel has considerably higher fish densities—even in the warmer summer months—than the South San Diego Bay reference station not subject to the thermal discharge.
- The studies actually showed evidence of seasonal eelgrass growth in an area of the discharge channel where it was assumed that eelgrass would not grow because of temperature extremes. Where evidence of effects on eelgrass was identified, the

effects were found to be associated with turbidity and not related to the thermal discharge.

- A Benthic Response Index was calculated for each benthic sample based on taxa and abundance and associated pollution tolerance indexes. As noted in the Fact Sheet, this analysis—done at the request of the resource agencies—concluded that the “benthic communities residing in south San Diego Bay are not degraded and any effects of the SBPP thermal plume are not consistent with the shifts in faunal composition seen on polluted areas of other bays in Southern California.”

The Fact Sheet infers that moving the temperature compliance point to the property line is necessary to achieve compliance with Section 316(a). Put another way, the Fact Sheet assumes that the apparently unacceptable detrimental impacts and lower diversity of benthic invertebrates will be measurably improved as a result of the assumed—but undetermined—decrease in thermal discharge that would purportedly result from moving the compliance point. This inference is fundamentally and technically unsupportable. In the first place, the current compliance point (S1) represents the location nearest to the property line at which sufficient mixing of the discharges from the four units has occurred, thereby ensuring a representative sample. Second, even if it were reasonable to assume that a lower discharge temperature would reduce effects on the benthic community (however limited any such effects may be), there is no evidence that changing the compliance point will, in fact, result in a substantive reduction in the discharge temperature. Even if this were the case, it simply cannot be suggested that such a change will cross some indefinable threshold of compliance with section 316(a). Further confounding this assumption is the fact that all evidence indicates that the discharge already meets the 316(a) BIC standard, making additional restrictions unwarranted. Given this, the Regional Board should have no reservations in affirming the finding that the power plant meets the 316(a) requirements.

Relocation of Temperature Compliance Point

Duke Energy has no objection to preparing a workplan that investigates the feasibility of monitoring temperature compliance at the property line. However, since the discharge—as monitored at station S1—currently meets the 316(a) standard, the thermal discharge limits should be modified (increased) as necessary to ensure that the power plant does not suffer any loss of generating capacity as a result of the change in compliance point.

As noted above, the principal reason that temperature is currently monitored at station S1 is because it represents the point at which the combined discharges of the four units are assumed to be sufficiently mixed and homogenous to provide a representative sample. Monitoring at the property line is not a simple proposition. The geometry of the discharge channel and location of the individual unit discharges into the channel make it very difficult, if not impossible, to obtain a representative measurement at the property line for all possible combinations of unit operation and tidal cycles. Even if this effort succeeded in identifying a representative monitoring point, there is a significant concern the plant's

generating capacity would be unnecessarily compromised if the existing temperature limits were not correspondingly modified. Since the thermal study did not identify unacceptable effects from the existing temperature limits, any reduction in generation capacity is unwarranted.

In summary, this proposed change in the temperature compliance point is unnecessary. However, if the Regional Board chooses to keep this requirement in the Order, we believe the permit should be modified to remove any reference to noncompliance with 316(a) and eliminate the presumption that the existing temperature limits should apply at the new compliance point regardless of the findings of the thermal effects study.

Special Sunset Study

The TO includes a condition that would require Duke Energy to "conduct a Special Sunset Study to evaluate the impacts of any proposed changes in the volume or temperature of the discharge on the beneficial uses south San Diego Bay." This proposed requirement appears to be borne out of a subtle recognition that the power plant discharge provides beneficial environmental effects. Implied in the condition is a suggestion that the Regional Board is considering the imposition of post-shutdown regulatory requirements to control ambient water quality after our discharges cease and, specifically, that Duke Energy will be responsible for mitigating the loss of beneficial effects once the power plant ceases to operate. However, the premise underlying this proposal, i.e., that any change in the volume or temperature of the discharge is or will be proposed, is incorrect. To clarify, at the time this requirement would be implemented any and all authority to discharge under the permit would be expired; there would be no "proposal" to change volumes or temperature. Rather, any such changes would result because the authority to discharge ceases when the permit expires or is terminated since Duke Energy will have no legal authority to continue discharging at that point.

Under these circumstances, there is no legal basis for the proposition suggested by Regional Board staff that Duke Energy may be held responsible for mitigating the loss of beneficial effects from the power plant once the power plant is shut down and the discharge ceases. The NPDES permitting authority of the Regional Board is defined by reference to the California Water Code and the federal Clean Water Act, neither of which allow the Regional Board to compel a discharger to continue discharging, to control ambient water quality after the authority for a particular regulated discharge ceases, or to implement mitigation measures upon cessation of a discharge. Given this, there is little value and no basis for requiring Duke Energy to conduct a study that will attempt to predict what will happen when the power plant shuts down.

That stated, Duke Energy is mindful of this concern and, within reasonable limits, we are not opposed to taking steps (when and if the power plant ceases operation) to ensure that output from the power plant is reduced or eliminated in a manner that minimizes impacts

from the loss of beneficial effects. However, we are interested in addressing this issue in a non-regulatory setting and using a more direct approach. To that end, Duke Energy is committed to working with the appropriate resource agencies in investigating strategies that will help us minimize the loss of beneficial effects from the discharge. We have already had preliminary discussions of such an idea with representatives of the National Marine Fisheries Service and received a positive response.

Duke Energy's voluntary commitment notwithstanding, as noted above, the NPDES permit cannot compel a discharger to mitigate for the loss or reduction of a discharge and therefore this issue should not be included for consideration as part the NPDES permit. It is also important to recognize that electrical dispatch from the power plant is dictated by the CAISO based on state and regional needs and therefore decisions regarding when and how much to operate the power plant are beyond the control of Duke Energy.

Increased and Specific Monitoring Requirements

Despite continual and substantial reductions in the toxicity of the SBPP discharge, the proposed TO contains significant increases in both effluent and receiving water monitoring requirements. The recent thermal effects study specifically and intensively evaluated some of the analytes that are subject to increased monitoring and concluded that there are no measurable effects from the discharge. For other analytes, such as hexavalent chromium, there is simply no potential for them to be added to the power plant discharge. Duke Energy currently spends approximately \$14,000 annually on the monitoring requirements in Order No. 96-05. The monitoring proposed in the TO will increase the annual monitoring costs to over \$100,000. We understand that some of the increased monitoring requirements are driven by requirements in the Basin Plan and SIP, however many of the increased requirements have been included solely at staff's discretion. Duke Energy requests that the Regional Board scale back the proposed monitoring requirements and limit the proposed monitoring to a suite of analytes and monitoring frequency that can be reasonably justified.

The TO also requires some monitoring to be performed within certain periods of the day. According to Regional Board staff, the desire is to restrict monitoring to the periods when the power plant is most likely to be operating at higher loads and, according to staff, therefore most likely to be discharging higher concentrations of the target analytes. However, outside of thermal loading, no correlation can be made between the typical power plant generation cycle and the characteristics of the power plant discharge. Furthermore, sampling of the discharge is already limited to certain periods based on the tidal cycle. Adding additional temporal restrictions on sampling will only serve to create instances where Duke Energy is physically unable to collect discharge samples in the specified time period. Since they are not practical and add no value, these restrictions on sampling should be eliminated.

This letter highlights the Duke Energy's most significant concerns with the TO. We reserve the right to make additional comments that result from our additional review of the TO or the broader issues therein. We also have comments on non-substantive issues (e.g., typographical errors) that we will forward to staff. Should you have questions regarding this submittal, please contact James White, Regional EHS Manager, at (805) 595-4295.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald W. Weaver III". The signature is fluid and cursive, with a long horizontal stroke at the end.

Donald W. Weaver III
Plant Manager

jmw/DWW
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